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China Report

AGRICULTURE

No. 114

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'GANG' BLAMED FOR AGRICULTURAL PRODUCTION SHORTAGE

Beijing NONGYE JINGJI WENTI [AGRICULTURAL ECONOMIC ISSUES] in Chinese No 3, 1980 p 10

[Article by Yang Jun (2799 0971): "The Question Concerning the Objective Patterns in Agricultural Production"]

[Text] I. Since the founding of the nation, what has been the situation of our nation's agriculture. Taking food grains for example, in the 1950's, we were self sufficient and there was a surplus, in the 1960's, the surplus turned into a shortage, in the 1970's, the shortages increased. In the provinces, three cities and one province have always imported food grains, except for these, eight other provinces (regions) have become dependent upon imports since the 1970's and for the past 2 years, imports of food grains by these nine provinces and three cities have increased greatly (in eight provinces (regions), the increase was 156 percent, in the one province and three cities, the increase was 30 percent). The number of provinces which always had a surplus for export decreased from 14 to 10 and the amount exported has dropped. Therefore, for the past 2 years the balance of surplus vs. shortage showed a big gap. The consumption of edible oil, sugar, cloth and animal and poultry products is still being limited by the low level of supply for long periods.

Our nation completed land reform at the beginning of the 1950's, and the completion of the cooperativization movement followed. For the past several decades, large scale water conservancy work and basic farmland construction have continued. The state is providing more and more farm machinery, chemical fertilizers and farm chemicals to agriculture. Agricultural research and agricultural education were actively carried out in a big way before the "Cultural Revolution." All these show that social labor and production in our nation's agriculture have all developed and improved greatly. Yet, we must face this cruel fact: our nation's food grains changed from a surplus to a shortage and there is a continuing shortage, and other necessary sideline foodstuffs are also constantly in short supply. How can this be understood? What is the fundamental reason? Besides a relatively rapid increase in population and the high frequency of natural disasters, the most fundamental reason is that during the past decade and more, agricultural production was seriously sabotaged by the "gang of four." Some regions already have "infertile land and poor people." The extreme leftist line of the "gang of four" is contrary to the natural patterns and economic patterns in agricultural production. Although during earlier years, the phenomenon of an irrational agricultural, forestry and animal husbandry structure emerged, during the period when the "gang of four" was rampant, the situation become very serious.

"The whims of the bureaucrats" contradicted the objective natural and economic patterns, the remnant poison is still profound and has not been completely eliminated. In some regions the poison is still spreading, causing our nation's people to work hard without getting the fruits of life and economic results which they should have. This has become one of the major concerns of many people.

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PROBLEMS IN, SOLUTIONS FOR DEVELOPING TEA PRODUCTION OUTLINED

Beijing NONGYE JINGJI WENTI [AGRICULTURAL ECONOMIC ISSUES] in Chinese No 3, 1980 pp 33 & 64

[Article by Xie Hongli (6200 3163 4409): "Adjust Policy to Promote the Rapid Development of Tea Production"]

[Text] Tea has always been our nation's traditional export commodity. Since the founding of new China and over the past 30 years, tea production rapidly revived and developed. Comparisons of 1979 and 1951 show that tea production increased 2.5 times, the amount purchased by the authorities increased nearly 5 times, the amount of exports increased nearly 3 times. Yet, our nation's tea production at present still cannot satisfy the needs of foreign trade and the domestic market.

The major problems are:

I. Tea Plantations Are Scattered, the Level of Production Management Is Low

The nation's tea production is scattered in 18 provinces and regions, 400 or 500 counties and also among many production teams. Because production is scattered, the level of management of tea plantations is generally low, causing a low unit yield and poor quality. In 1978, our nation's area of tea plantations constituted 45 percent of the world's, but the yield constituted only 15 percent. The amount of exports accounted for only 13 percent. Average per mu yield of tea in our nation is over 70 jin, about half that of Sri Lanka, one-third that of India, and one-fourth that of Japan. Compared to the teas of these nations, our nation's teas have a narrow bud, the leaves are thin, the exterior is coarse and loose, the fragrance is mild, the taste is light, the leaves are not durable, etc.

II. The Commune Brigades Generally Engage in Refining and Processing Tea Leaves, Affecting the Quality of the Product

Since the movement to organize agricultural cooperatives, preliminary processing of tea leaves in our nation is done by the commune brigade tea farms. Refined tea is processed by the state-run tea refineries. But for the past several years, especially since last year, to increase the income of the farmers, tea producing regions everywhere asked the commune brigades to operate tea refineries. Refining and processing of tea leaves is a complex technological process and it requires a definite amount of machinery and equipment and technical strength to assure the quality of the tea leaves. Commune brigade tea refineries frequently lack these conditions, and the quality of the tea cannot be assured. This has seriously affected the completion of export plans.

III. The Industrial and Commercial Taxes on Tea Are High, There Are Many Management Links, the Retail Price Is Therefore High, the Purchase Price Is Low, the Managerial Departments Suffer Losses

Of the industrial and commercial taxes levied on tea, the tax rate on coarse tea is 40 percent, and the tax on refined tea is even higher. For example, Henan Province's first grade and first class mao feng tea is purchased at 495 yuan per dan, the market retail price is 850 yuan, a difference of 355 yuan, the tax is 223.5 yuan, or 63.84 percent of the difference between the purchase and the sales prices. Tea is frequently handled by five to six intermediate concerns from the time it is purchased as coarse tea to the time it is sold as refined tea to the consumer. Because there are many intermediate concerns, the taxes are high, the costs are great, the sale price is pushed upward, unfavorable to the production and sale of tea.

IV. Poor Management of the Market, the Loss of Tea Is Serious

According to incomplete statistics, the entire nation produced about 5.76 million dan of tea in 1979. The state purchased 4.8 million dan, deducting the amount normally kept by the commune brigades for their own use, the amount of loss of tea is about 400,000 to 500,000 dan. Many commune brigades and state farms take the tea they produce to the collective market or set up their own retail outlets to sell the tea. Many organizations, groups, enterprises and plants and mines also go to the commune brigades or state farms to purchase tea, causing a loss of 30 to 40 million yuan in taxes. The teas produced and sold by the commune brigades and state farms themselves are often higher grade local brand name teas. For example, long jing tea is in short supply even at retail stores that sell only to foreign visitors. But the commune brigades are selling it en masse in their own retail outlets.

To promote the development of tea production, increase the amount, raise the quality, and satisfy the demands of foreign and domestic markets, the following should be grasped well in adjusting the national economy:

I. Adjust the Distribution, Grasp the Construction of Tea Production Bases Well

The technology of tea production is strong. The quality of tea is determined first by the quality of the raw material of fresh leaves and this is determined in turn by the variety of the tea tree, external environmental conditions, management of the tea plantation, prevention and control of diseases and insect pests. Therefore, planting of tea trees must be appropriately centralized to facilitate scientific management. At present, the overly scattered production situation must be gradually adjusted. The planting areas of tea plantations in regions where the soil and climatic conditions are suitable for the production of tea trees, regions where the production is higher and where the quality is better should be expanded. Governments at all levels should provide assistance in capital, materials and fertilizers to establish a group of commercial tea production bases.

II. Industrial and Commercial Taxes Should Be Reduced, the Circulation Links Should Be Simplified, the Purchasing Price Should Be Raised, and the Retail Price Should Be Stabilized or Appropriately Lowered

Except for a few regional brand name teas at high prices, it is suggested that the tax rate on most varieties of tea be reduced from 40 to 20 percent and the other

20 percent be used to raise the purchasing price and the benefits should be given to the commune brigades. To promote the improvement of the quality of tea, seasonal price differentials and grade differentials in price should be implemented. Tea that is exported and earns a lot of foreign exchange can also be subsidized above the price to reward the commune brigades, pickers and purchasers. The number of links in the circulation should be reduced. This is an important way to turn losses into profits, increase yield and conserve, and reduce the retail price. The potential in these aspects is great. Some provinces have already realized direct exports by the tea refineries, greatly reducing costs and expenditures, and outstanding results have been achieved. This work must be tightly grasped by all localities.

III. Profits of the Tea Refineries Are Mostly Returned to the Commune Brigades Providing Coarse Tea Raw Material

The profits of the tea refineries are greater, therefore each locality has asked to build them in a big way. According to information provided by the Yunnan Provincial Tea Company, the province produces about 300,000 dan of tea annually. The profits of the tea refineries are higher, and a similar situation is found in other provinces. Planting of tea trees by the production teams, picking, preliminary processing, state purchases and refining constitute a complete and mutually connected process. The profits of refining is overly large. Actually, part of the profits has been taken away from that of commune brigade labor. To solve this problem, the best method is to return most of the profit from refining to the commune brigades that provided the coarse tea raw materials and truly give the benefits to the farmers. This can overcome the blind development of tea refineries by the commune brigades and benefit planned management.

IV. Market Management Should Be Strengthened to Make Sure the State Purchase Plans, Transfer Plans and Export Plans Are Completed

Tea is a second category commodity in the state's planned management. Planned adjustment should be the key. The state should sign contracts with the commune brigades. The state should assist the commune brigades to produce tea by providing capital and materials. The commune brigades should exert efforts to elevate the yield and quality and should sell to the state the appropriate portion on time and according to the required quality and quantity. The portion beyond the plan can be handled by the state to reward those commune brigades that sell more to the state by reducing or eliminating industrial and commercial taxes. The state can also reward those commune brigades that have sold more and good quality tea by providing some of the industrial products urgently needed by the farmers, such as bicycles and sewing machines so that the commune brigades can combine state benefits, collective benefits and individual benefits together well. To strictly prohibit the organizations and groups from purchasing tea from commune brigades on their own, and prohibit the commune brigades and the state farms from going to the collective market or setting up their own retail outlets to sell tea, they must pay taxes according to policy.

As long as our policy is correct, and by correctly handling the relationship between the state, the collective, the individual and production, circulation and consumption, tea production will surely undergo rapid development.

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FURTHER CONSTRUCTION OF GRASSLANDS URGED

Beijing NONGYE JINGJI WENTI [AGRICULTURAL ECONOMICS ISSUES] in Chinese No 3, 1980 pp 34, 35, 4

[Article by Zheng Boquan (6774 0130 2938): "Several Opinions On Strengthening Construction of Grasslands"]

[Excerpts] I. Our nation's grasslands are vast and rich and their potential is great. They have created superior conditions for the development of animal husbandry. But, according to statistics of major grazing regions, there were a total of 83,865,000 head of domesticated animals in 1978, constituting 14.8 percent of the total number of 565,120,000 head nationwide. Those in the major grazing regions constituted 53.4 percent of the total of 160,120,000 head in 1949. If the 301,285,000 head of hogs kept in pig pens are deducted, there are a total of 263,830,000 head of herbivore animals nationwide. After deducting the number of domesticated animals in the major grazing regions, there are 179,965,000 head of herbivore animals in farm regions (these may possibly include the animals raised on the 1 billion mu of grassy mountains and grassy slopes, because of a lack of individual statistics, they cannot be separated.) Animals in the major grazing regions constitute 46.8 percent of the animals in farm regions. The numbers show the large and small animals in the major grazing regions are almost equivalent to half of the herbivore animals in agricultural regions. The area of grassland in grazing regions is three times larger than the area of farmland but the number of animals raised is less than that in agricultural regions. This fact is sufficient to show that the potential of the grazing regions is great and the future is bright. To develop the superiority of grasslands to raise more animals, construction of grassland must be hastened.

II. Although our nation's grassland resources are rich and the conditions for developing animal husbandry are very good, because of use and because construction is neglected there are many problems in the construction of grasslands.

1. Degeneration of grasslands and a drop in the quality of grass for grazing.

2. Grassland is claimed for planting of food grains, agriculture squeezes out grazing, thus damaging both agriculture and animal husbandry. Claiming wasteland for planting has existed since ancient times. Since the founding of the nation, it has not stopped. Even when state farms did not reclaim land, the communes and brigades did. Under the sabotage of the leftist line of Lin Biao and the "gang of four", this was more serious. Taking Xinjiang as an example, wasteland was reclaimed

each year and the area of cultivated land expanded year after year but food grain production did not increase. On the contrary, food grain production dropped in 1975 from the highest annual yield of 6.68 billion jin in 1966 to 6.29 billion jin. At the same time, the number of large and small animals in 1978 was less than the highest number in the past reached in 1965 by 985,000 head, or 10.3 percent. Also, the half agricultural and half grazing regions of Suihua and Nenjiang in Heilongjiang originally had grasslands of 41.23 million mu. Because of reclamation of wasteland for planting food grains, the area of grassland in 1978 was only 22.54 million mu, a reduction of 54.6 percent. As the land was reclaimed, it became sandy. According to statistics, of the over 500 million mu of grassland in Nei Monggol, the area that has become sandy has reached over 80 million mu. According to calculations, reclaiming one mu of grassland will cause 3 mu of grasslands to become sandy or degenerate. Finally, "farmland consumes grazing fields, and wind and sand consume farmland," and a situation in which both agriculture and animal husbandry are harmed is created.

3. Serious damage by rats destroys grasslands. According to statistics of Qinghai, the area damaged by rats has reached 120 million mu, constituting one-eighth of the total area of grasslands. Because of serious damage by rats, 5 billion jin of dry grass are lost annually, equivalent to the amount of feed for over 5 million sheep.

III. Construction of grasslands is the center for developing animal husbandry. Comrade Mao Zedong pointed out once, "grazing grass is a question of life and death for domesticated animals." The practical experience of the masses is, "without grass for grazing it is difficult to raise domesticated animals." Therefore when we develop animal husbandry, we must grasp construction of grasslands tightly.

Our grazing regions are mostly in high and cold areas and mountain areas. Each year, half of the year is spent in cold seasons. Because our grasslands are naturally grown and are not produced by man, the grazing grass is dry and withers in winter and after a strong wind little is left. When covered by snow, finding grass for food is difficult, grass reserves are limited, and each year 6 percent of the domesticated animals always die of cold, hunger or disease. More die in years of disasters. It is not possible to change the backward situation of animal husbandry if grasslands are not constructed.

First, renewal of grazing fields of large areas should be widely watched. The method of renewing grazing fields of large area is to widely mobilize the masses, strengthen the sense of responsibility of herders, give them a short period of training, let them gain the scientific knowledge of protecting the grazing fields, and let them understand the natural patterns of growth of grass for grazing and the relationship between seeking food by the domesticated animals and the growth of grass for grazing.

Second, construct man-made grasslands according to plan. Since the founding of the nation, we have only encircled a total area of 60 million mu as grasslands. Man-made grasslands are even less in area, only 9 million mu. Compared to nations with developed animal husbandry, Holland's man-made grasslands constitute over 80 percent of the total, New Zealand's over 60 percent and England's 59 percent. We have much less.

Fifth, establish the right to use grazing fields. Degeneration of grass for grazing and grazing fields becoming sandy are also greatly related to the unstable use of grasslands. When the right to use grasslands is not fixed, everyone competes for the grasslands for his herds. Herders go to where the grass is good, disregarding the degree of renewal of the grass for grazing. As soon as tender buds emerge, cattle and sheep are released to graze. This phenomenon is more serious in regions of mixed agriculture and animal husbandry. At the same time, there is nobody to take care of the grass for grazing, there is nobody to plant trees, and over the 30 years since the founding of the nation, the grazing regions have not been forested. Singular efforts were made to raise animals in quantity, like singular efforts to produce food grains and the benefits of combined agriculture and animal husbandry cannot be gained. To construct grasslands well, the best method is to take the commune brigades as the unit, to mark out the grazing fields clearly, and to establish fixed rights for the use of grazing fields. The use of grazing fields and construction of grazing fields should be tightly combined to strengthen the duties of commune brigades to protect the grazing fields and to construct the grazing fields.

In solving the problem of construction of grasslands, economic results must also be emphasized. No matter how good the technical results, if their economic benefits cannot be combined with the personal benefits of the masses, then they cannot be popularized easily and will not be easily accepted by the masses.

December 31, 1979

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NATIONAL

SOLUTIONS OFFERED FOR SURPLUS RURAL MANPOWER PROBLEM

Successful Example in Liaoning

Beijing RENMIN RIBAO in Chinese 15 Sep 80 p 5

[Article by reporter Wang Ke [3769 3784] and correspondent Wu Guang [0702 0342]: "Chengjiao Commune in Panshan County Gathers Fund To Build Plant To Utilize Surplus Manpower"]

[Text] Since October of last year, the Chengjiao Commune in Panshan County, Liaoning Province, has, by utilizing a portion of surplus manpower, built five plants, including printing, carpet, regenerated rubber, and wood processing, using voluntary investment capital and the joint management method. These plants not only have employed more than 240 surplus personnel but also have satisfied the needs of local production and people's lives, with the result that these plants have been very well received by the local populace.

In recent years, with the progress of national construction undertakings, and especially after the construction and exploitation of the Liaohe oilfield, a large area of cultivated land that belonged to the Chengjiao Commune has been taken up. As a result, there are now an average of only 4.5 fen of cultivable land area per person, and more than 3,500 manpower have become surplus. They have urgently been demanding a solution to this unemployment problem. In the past 2 years, 2,000 persons have been placed in various enterprises operated by the Chengjiao Commune, but 1,500 or so are still unemployed. Thereupon, some people came up with the idea of organizing a company with voluntary investment capital. The party committee members of Chengjiao Commune and Panshan County considered the idea feasible and rendered timely assistance to them in matters related to materials and taxes so that these plants could be organized quickly.

The structure of these plants is not the same as that of an ordinary plant. The plant manager, the accountant, and the personnel in charge of supply and distribution are persons selected from the masses who display a certain aptitude and a special knowledge during the process of organizing these companies. They perform their appointed tasks when there is work to do and join with other workers in production when there is none. The production plans of these plants are determined not by the national government or by the higher level office but by the enterprises themselves according to the needs of society. The labor wage is determined according to the worker's level of skill and his contributions. They are firmly upholding the following three principles while conducting their business management: 1) In order to fully demonstrate the advantage of "a small ship is easy to turn around," they have adopted as their production policy the principle of "one master with many followers." 2) They practice volume sales with small profit and accumulate profit by the principle of the "snowball effect." 3) They expand production aggressively, following the principle that "if there is no water in the well, we will fetch water from elsewhere." Within a period of just one-half year since these five plants were organized, they have manufactured more than 20 items valued at more than 270,000 yuan, which is more than 1.5 times the total capital accumulated at the time the plants were organized.

Six-Point Proposal

Shanghai FUDAN XUEBAO--SHEHUI KEXUE BAN [FUDAN UNIVERSITY JOURNAL--SOCIAL SCIENCE EDITION] in Chinese No 5, 20 Sep 80 pp 101-104

[Article by Zhang Guangsheng [1728 1684 3932], graduate student majoring in economics: "A Preliminary Study of Surplus Rural Manpower Problem--An Investigative Report Concerning Placement of Surplus Manpower in Various Businesses by the Malu Brigade of Jiading County"]

[Text] An agricultural economic survey was carried out recently in Jiading County [Shanghai]. The cadres and the masses reflected strongly that in order to accelerate the development of rural mechanization, the rural manpower employment problem must be solved first. The phenomenon of surplus rural manpower must be altered quickly.

I.

How extensive is the latent rural manpower in the Shanghai suburbs? How do we make arrangements for surplus manpower during the process of rural mechanization? We can have a glimpse from the changes that have taken place in the Malu Brigade in a period of 2 years, 1978 and 1979.

Malu Brigade was established jointly by the city and the county in 1978 as an experimental focal point for carrying out overall rural mechanization. In 1979 the brigade organized, with the assistance of the county and the commune, various brigade-operated enterprises such as a shirt factory, a lightbulb plant, and a mushroom farm. As a result, significant changes have taken place in the placement and usage of manpower today.

The numbers and distribution of the manpower of Malu Brigade in 1978-79 are shown in the following table, listed by the various types of operations.

(A)	(B)	(C)		(D)		(E)	
年份	总劳动力	务农社员		务工社员		副业（包括牧业）	
		(F)人数	%	(F)人数	%	(F) 人数	%
1978	1,471	993	67,5	408	27,7	80	5,4
1979	1,532	542	35,3	865	56	125	8,2

Key:

(A) Year
(B) Total manpower
(C) Agricultural commune member
(D) Industrial commune member
(E) Sideline (including animal husbandry)
(F) Number

There were 451 fewer commune members engaged in agriculture in 1979 than in 1978, and the percentage of agricultural commune members to total manpower dropped from 67.5 to 35.3 percent. At the same time, the number of commune members engaged in industry increased by 457, from 27.7 to 56 percent. Within a year, the number of commune members engaged in industry increased by 457. How many of these, after all, constitute the surplus manpower created as a result of increased mechanization achieved in 1979? How many were persons who have been harbored in the brigade originally?

When Malu Brigade was newly established in 1978, the level of mechanization in various areas, including cultivation, irrigation, planting, harvesting, threshing, and feed processing, was comparable with the overall level of mechanization in the entire country. The experimental mechanization carried out in 1979 by the Malu Brigade included the following items: Coordination between paddy rice seedling cultivation plants and the mechanical planter in order to eliminate the pulling-planting process. Trial operation of the half-feed combine harvester to carry out a series of simultaneous operations, including cutting, bundling, carrying, threshing, and cleaning the field. Transplantation of cotton from nutrient pots to troughs [1152 2864], carried out by the trenching machine. The trial operation of ditch-digging machinery, oilplant trenching machine, and machinery for application of manure has resulted in improved efficiency. According to an estimate, manpower equivalent to 74 men can be saved from the use of this equipment. This means that of the 457-man increase in the number of commune members engaged in industry in 1979, only 74 constituted the surplus created by raising of the level of mechanization. The other 383 constituted the surplus created as a result of mechanization in the past and have been harbored in the production team. This portion of surplus manpower is 38.5 percent of the total manpower engaged in agriculture. In other words, this amounts to a rate of manpower sheltering of 38.5 percent. The above analysis was based on the premise that the total manpower of the entire brigade in 1979 had been fully utilized. But in reality, the potential manpower of the brigade in 1979 had not been fully utilized. The proof of this is provided by the fact that the brigade was planning to pull out manpower from each production team, and was expecting the number to be quite sizable. The brigade is currently planning to build a spray paint factory [employing] 100 men or so. The existing shirt factory is also carrying out negotiations with the assisting units to introduce another production line which will need 70 men. Although a small portion of the required manpower may come from personnel reassigned from the existing enterprises under the control of the brigade, the majority of the 170 people must be taken from the production teams. Based on the present status of manpower in various production teams—except for Wangjia and Yangjia production teams, from which no workers can be pulled out—Wujia production team can supply 5 workers and the other 9 production teams can each provide 10 men or so. In some of these production teams, every family has at least one member already engaged in industry. It is difficult therefore to take away additional members without arousing complaints, so nobody will leave the production team for the time being. However, there is in fact still some potential that can be exploited. The 383 persons taken in 1979 added to the 95 planned to be pulled out in 1980 make a total of 478, or 48 percent of the total manpower of 993 who engaged in agriculture in 1978. This figure still has potential for growth. Therefore, it is not an overstatement to say that Jiading County reached the rural mechanization standard in 1978, and that there still is approximately a 50-percent surplus of manpower among those commune members who engage in agriculture. This enormous potential manpower must be fully utilized by increasing the depth as well as the breadth of production activities.

II.

A significant economic effect has been achieved by Malu Brigade by simply placing the surplus manpower harbored by the production teams into industrial production and sideline production.

1) The labor production rate has been increased.

While total agricultural production declined in 1979 (due mainly to the reduction in the cultivated land area and generally poor crops), per capita production of grain, cotton, and oilplant seed increased 52.1, 52, and 57 percent, respectively, over 1978. (See table below.)

(A)务农社员劳动生产率变化,

(B) 年份	(C) 务农劳力总数	粮 (D) 食		棉 (E) 花		(F) 油菜籽	
		(G)总产	(H)斤/人	(G)总产	(H)斤/人	(G)总产	(H)斤/人
1978	993	2,394,500	2,411.4	136,600	137.6	135,600	136.6
1979	542	1,988,200	3,668.3	113,400	209.2	116,200	214.4
(I) 两年相比±	−451	−406,300	+1,256.9	−23,200	+71.6	−19400	+77.8
(J) 两年相比增减%	−45.1	−17	+52.1	−17	+52	−14.3	+57

Key:

- (A) Changes in the labor production rate of commune members engaged in agriculture
- (B) Year
- (C) Total manpower engaged in agriculture
- (D) Grains
- (E) Cotton
- (F) Oil plant seed
- (G) Total production
- (H) Jin/person
- (I) Two-year comparison
- (J) Percent gain or loss in 2-year comparison

2) Capital for agricultural development has been provided.

Malu Brigade placed 457 workers in brigade-owned enterprises in 1979. Diversified operation production provided total profits of 133,489 yuan, of which 81,915 yuan, or 61.4 percent, was spent on items in support of agriculture. This has not only strengthened the collective economy but also provided the nation with tax income.

3) Commune members' income has been increased.

Since those members who engage in industry do not participate in production team distribution, the total number of labor days of the production team which does participate in the distribution has been reduced by 73,787, and the income of commune members who engage in agriculture has proportionately increased. In addition, the profits created by those commune members who engage in industry are, according to the principle of profit-sharing, in part returned to the production team and distributed to the commune members in the form of cash awards. As a result, while total agricultural production decreased in 1979, the level of distribution to the commune members increased appreciably. On average, this income reached as high as 294.5 yuan, an increase of 60.54 yuan over the 1978 figure. The average production per manpower was valued at 519.38 yuan, an increase of 141.38 yuan over 1978.

Based on the circumstances we encountered during the course of this investigation, we found that the phenomenon of surplus manpower being harbored inside the production team was prevalent all over the county. Basing our estimate on the 50-percent rate of sheltering surplus manpower that was discovered in the Malu Brigade, 77,233 of the 154,466 commune members engaged in agriculture all over the county may be considered harbored surplus manpower. In other words, only 77,233 persons are required to manage the agriculture of the entire county. Let's look at the average cultivated area managed by each commune member engaged in agriculture. After the surplus manpower harbored in the Malu Brigade was pulled out again in 1980, the average cultivated area managed by each commune member engaged in agriculture amounted to 5.4 mu. There are 449,480 mu of cultivated land in this county, so the average area per commune member engaged in agriculture comes to 2.9 mu. We have stated previously that the level of mechanization in the Malu Brigade approaches the average countywide level. Calculating according to a figure of 5.4 mu, the average cultivated area per commune member who engaged in agriculture in Malu Brigade, only 83,237 persons would be required to manage the agriculture of the entire county. As long as the other production departments are capable of absorbing the surplus manpower, the total manpower countywide which can be mobilized immediately is 71,229. (This number is in approximate agreement with the figure based on the amount of surplus manpower sheltered in the Malu Brigade.) If this portion of the manpower can be placed in various other production departments countywide, the labor production rate of the commune members engaged in agricultural production can be raised 50 percent immediately, since there will be no need to increase investment on the agricultural front.

So far, we have discussed the conditions of existing rural manpower. However, we must not lose sight of the following when we contemplate placement of the rural manpower.

1) According to the circumstances of natural population growth in Jiading County from 1960 to 1978, an increase of 5,314 manpower countywide each year can be expected over the next 20 years. Excluding those who go to college, serve in the armed forces, or retire, there will be a net increase in manpower of 4,000 each year.

2) The level of mechanization in Jiading County today is still far below the required level of overall mechanization. Be it farming or animal husbandry enterprise, there is not a single crop or animal whose production process is completely mechanized. Except for plowing, (irrigation) cultivation, and threshing, other work processes of major crops have, in general, not yet been mechanized. There are altogether more than 60 work processes related to handling of major crops such as grains, cotton, and oil plants. The extent to which machinery is used in these work processes is 35 percent for paddy rice, 43 percent for three wheats, 29 percent for cotton, and 20 percent for oil plant. When the level of mechanization for each is one day raised to the level of 85 percent, there will be a large portion of additional manpower which will become liberated.

In 1979, there were 216 seedling pullers and 2,560 seedling planters countywide. Experimental data have proven that seedling planting carried out by machine is not much better than that done by hand. In recent years, the utilization rate of this machinery is no higher than 15 percent. To be sure, the quality of the machinery itself and some technical problems need to be solved. However, the main obstacles preventing wide popularization of this farm machinery in the rural community is the fact that there is no shortage of manpower there. After using planting machinery continuously for 5 years, the Dengqiao Brigade of the Malu Commune discontinued it last year. Yet the same brigade organizes six or seven machinery teams each summer to help neighboring Wuxi and Taibang production teams carry out their planting operation. The cadres of the production team and the commune members are unanimous in their thinking: "Rather than spend currency to feed the machinery with oil, why not let it earn some cash for the commune members? In any case, we have plenty of manpower." We could not help but be alarmed by this kind of situation.

III.

One of the characteristics of our national economy is the large population, 80 percent of which are farmers. We have a large land area, but the area of cultivable land is small. Our foundation is weak. The rate of industrial growth is incapable of completely absorbing the increased manpower in the city, much less absorbing surplus manpower from the rural area on a large scale. Therefore, surplus rural manpower has to find placement in the rural community itself; the problem has to be solved locally.

Based on the circumstances at Jiading, I believe that the surplus rural manpower in the suburbs of large cities may find outlets in the following areas:

1) Commune and brigade enterprises should be developed aggressively by taking full advantage of the favorable conditions of large industrial bases. The commune- and brigade-operated industries of Jiading County started early and developed rapidly

with a good foundation. During the 10-year period from 1970 to 1979, commune- and brigade-operated industries not only brought in profits amounting to 442.14 million yuan but also strengthened the collective economy of the commune and absorbed more than 50,000 manpower, including more than 9,000 last year alone. During the process of reorganization, the large industries in Shanghai dug up latent potential, innovated, and reformed. As a result, many products, especially light industrial products, have "molted" and spread out. Commune-brigade enterprises must satisfy the needs of the people and the demands of the market. They must fully demonstrate the characteristic that "a small ship can turn around quickly." They must fully utilize the rural manpower resources and, according to what local circumstances dictate, adopt either an independent, a joint, or a cooperative form of operation in order to promote the growth of commune-brigade industry one step furtner.

2) Aggressively develop handicraft products by developing the local characteristics. Yellow grass weavings, embroidery, and bamboo carvings are traditional handicrafts of Jiading County which have been exported and are well received abroad. Production of handicrafts such as wallpaper, potted plants, flowers and birds, mounted pictures, and toys, has a definite foundation. Production of these handicrafts requires a large amount of manual operation and consumes a large amount of labor, but it requires little capital and yields a large profit. Production can be either centrally operated or dispersed and done at each commune member's home. Taking full advantage of the abundant manpower resource, a plan for the development of commune-brigade enterprises in Jiading County suggested that in 1980 the county and the commune, at both levels, should train 3,000 to 5,000 embroiderers; this embroidery force may be expanded to 20,000-30,000 within 2-3 years by the snowballing method. We must say that this is an aggressive measure.

3) Prepare to establish a farmers' housing construction company. The commune members unanimously felt that building houses is a great event in the rural community. To build a house by himself, a farmer must not only spend money, material and labor, but most of all, he must expend a great deal of effort. To meet the needs of rural housing, we must organize various skilled workers scattered all over the village, such as masons, roofers, and carpenters who handle wood as well as bamboo, and try to establish a rural housing construction company which will undertake all rural housing construction work. The company's main purpose would be to serve the needs of rural construction. However, it may also undertake urban construction whenever proper, as well as construction of basic items.

4) Trial operation of an enterprise jointly managed by agriculture, industry and commerce. Last year, Jiading County trial-operated an enterprise, jointly managed by agriculture, industry, and commerce, which dealt in garlic and mushrooms. Various links of the undertaking, from production, procurement, processing, storage, and transportation to distribu[illegible]re organically linked, thus realizing "a single dragon" format of operation and successfully transforming rural byproducts into finished products and valuable commodities. Establishing a processing industry and commerce in the rural community not only brought about excellent economic results but also found placement for a portion of the surplus manpower, thus opening up a new route for absorbing surplus rural manpower locally.

5) Simultaneously raise the levels of the five enterprises and aggressively develop multiple operations. Jiading County has a great potential for developing multiple operations. There are 8,000 mu of water surface area all over the county which have yet to be utilized. Besides fish culture, pearl oyster culture may also be developed. Assuming that 2 persons per mu will be required, this industry will be able to absorb 4,000 personnel. According to the standard set by the Ministry of Agriculture and Forestry, there ought to be 30 trees per mu. In Jiading County the average is nine trees per mu. Planting and maintenance of additional trees can also absorb a portion of the manpower. Since there are too many people and too little land, we must look for those production routes which require a large labor force and little or no land area--for example, cultivation of edible fungi such as mushroom, white morel, and houtou [3729 7333]. There is also a great potential in raising domestic fowl. At Dongfeng Brigade, Xuxing Commune, two persons raised 5,000 chickens in 1979 and made a net profit of as much as 13,666 yuan.

6) The rural community may also consider implementing a retirement system and also consider lowering the retirement age. The retirement system adopted in the rural community of Jiading County today sets the retirement age at 65 for men and 60 for women. These retirement ages may be lowered to 60 for men and 55 for women. The small pension is the main reason why most of the commune members are not very eager to retire. The policy should encourage retired commune members to develop family sideline occupations, and the production teams should assist them in developing their family sidelines with materials--especially the development of those sidelines which the collective cannot carry out at once. Let the income from the sideline occupation plus the retirement pension approach the income from the production team before retirement.

Specific ways for placing manpower must be constantly searched for during the course of practice. However, we can be quite sure that systematically placing surplus manpower in such areas as forestry, animal husbandry, sideline occupations, and fishery by aggressively developing multiple operations and establishing commune-brigade operated industries, commerce, processing industries, construction industries, service industries, etc. do not constitute "abandoning agriculture for commercial operation." It may be said that, to some extent, the objective need for rural mechanization can be created only when there is a shortage of rural manpower. Mechanization can thrive only under such circumstances.

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FIELD EXPERIMENTS, CONTROLLING ERRORS RESEARCHED

Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 4
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[Article by Zhao Renrong [6392 0088 6954], Di Wanxuan [5049 1238 5503] and Xu Jin [1776 6930]: "Field Experiments and Statistical Methods"]

> [Text] In January of this year, the Ministry of Agriculture asked the Shenyang Academy of Agriculture to conduct a training class in national biological statistics and field design. We have arranged with Professor Zhao Renrong [6392 0088 6954] and lecturers Di Wanxuan [5049 1238 5503] and Xu Jin [1776 6930] of the Shenyang Academy of Agriculture to write a popular lecture on "Field Experiments and Statistical Methods" for publication starting from this issue. If the readers encounter any questions in the course of learning and practice, please write and tell us.
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> -----Editor

Field Experiment

Field experiment is the basic form of scientific experiment in agriculture. All scientific experiments in agriculture using the field as the environment and crops as the subject of the experiment are called field experiments.

The results of field experiments are influenced by the crops themselves, external natural conditions, level of management and cultivation and other various factors. Such experiments are complex. Because there are few factors which can be controlled, experimental errors are easily made, thus reducing the accuracy of the experimental results. Therefore, how to reduce experimental errors and improve the accuracy of the experimental results become the central questions which must be considered in field experiments.

Chapter I. Controlling Experimental Errors

Improving the Accuracy of Experiments

The results of field experiments should be accurate and reliable. This means the errors of the experiment must be small, and the comparisons made between experimental treatments must be accurate. Only by controlling experimental errors can the accuracy of the experiment be improved.

I. Reasons that Cause the Difference

Regardless of the type of field experiment, the purpose is to search for the variety that produces the greatest increases in yield or the measure of cultivation. Therefore the different treatments (or varieties) set up by the experiment should manifest visible differences. Actually, the results of each treatment in any field experiment will differ to varying degrees, some are manifested in the yield, some are manifested in the height of the plants, thickness of the stems, resistance to disease, resistance to lodging, growth periods and various morphological and physiological characteristics. Analysis of the results of field experiments shows that the causes that create the differences among the various treatments (or varieties) are the following:

1. The nature of the productive abilities of the treatments (or varieties) is different. For example, hybrid sorghum and hybrid corn generally produce a higher yield than local varieties. In phosphorus deficient soil the application of phosphorous fertilizers will produce a visible increase in yield as opposed to no application of phosphorous fertilizers. This shows that the nature of the yield of hybrid varieties and local varieties and the nature of the yield of applying and not applying phosphorous fertilizers are different.

2. The effects brought about by the difference in soils. Soil is the basic condition in field experiments. If the soil of the experiment has even fertility and the conditions are consistent, then the experimental results will clearly show the differences in the nature of each treatment and the results will be accurate and reliable. Yet actually the soils of each experimental region are all different in degrees. The differences are mainly due to the soil's formation processes and are caused by human productive activities, such as topography, soil texture, soil nutrients, moisture, methods of planting and fertilization, amount of fertilization, and the different types of forecrops. These differences are widespread, absolute, and there is no completely even and consistent soil. Even land that seems to be very even on the surface will have some differences.

3. Differences caused by various other factors. For example, the duration and quality of field operations in the experimental area cannot easily be controlled in exactly the same manner. Experimental materials (including seeds and seedlings, plants etc) cannot be completely consistent, therefore germination of the seeds, the speed of budding, the growth conditions in the field will be different. In addition, there are also various causes that come about by chance (also called chance factors), such as trampling by animals during the period of field operations in such area, the degree of damage by diseases and insects and microclimates are not entirely the same, and these factors will produce large or small effects upon the experimental results.

4. Human errors. Because of a poor grasp of the theory and the method of the experiment, errors frequently occur in work. For example, a poor field selected for the experiment will have soil that varies greatly. Mistakes in the design of the experiment (such as the lack of repetition in small area experiments, only one small area is planted, planting only one or two long ridges for one treatment to conduct comparisons etc), taking too few samples or taking samples that are not representative, negligence in work, recording wrong numbers, misreading the scale, etc will all create big errors and seriously affect the accuracy of the numerical data of the experiment.

II. The Origin of Experimental Errors

Of the several reasons that bring about differences mentioned above, the first is the purpose of field experiment itself which requires that the greater the difference among the various treatments (or varieties) the better for selecting the superior and discarding the poor and for continuously increasing the yield. The second is the difference in the soil and the third, i.e., the differences caused by other various factors, are interfering factors in the experiment, and are the major source of experimental errors. If they are not controlled and eliminated, greater experimental errors will be created. The occurrence of errors often interferes with our correct judgment of experimental results, even causing us to make erroneous judgments and making contrary conclusions. Therefore, the smaller the experimental errors the better. But, because field experiments are affected by natural factors and chance factors to a greater extent, some experimental conditions (such as soil, experimental materials, quality of operations) can only be controlled as much as possible and it is very difficult to control them completely and to make them absolutely consistent. Therefore all experiments have different degrees of errors that affect the accuracy of the experiment. Only in relatively strict and accurate experiments will the error be small, and if the opposite prevails, the errors will be greater.

Human errors are mistakes of work and are not experimental errors. They should be completely eliminated. Otherwise the experimental results will frequently have to be scrapped.

II. Methods of Controlling and Eliminating Experimental Errors

Analysis of the sources of experimental errors shows that the following ways can be considered in controlling and eliminating experimental errors and increasing the degree of accuracy of the experimental results.

1. Conscientiously select a good experimental field according to requirements and exert all efforts to eliminate differences in the soil at the root cause.

2. Have a rational experimental design, use small area experimental techniques and corresponding statistical methods, further control and reduce the differences in the soil, and exert all efforts to reduce errors caused by other conditions.

3. Except for the differences in the measures for each treatment (varieties) for experimental comparison, all other conditions of the experiment should be even

and consistent as much as possible. Therefore experimental materials of the same quality must be used and each field operation must be performed according to the time and quality required by the experiment.

4. Inspect the conditions of growth in field experiments and the time and the standards must be uniform. When measuring the yield, samples must be representative, even and rational and the amounts should be sufficient.

Chapter II. Design of Small Area Experiments

I. Determine the Content of the Experiment

Before conducting an experiment, a decision based on the requirements of the experimental task must be made to decide whether to perform a single factor experiment or a multiple factor experiment, and then the experiment should be designed separately.

Single factor experiment is to study a single factor (also called factor) in one experiment. This factor can be treated in several ways for comparison. For example, to compare the results of increased yields of several new varieties of corn, a contrast with the local original varieties can be made. This experiment requires only the study of one factor of the varieties. The new variety and the original variety are the several treatments of this experiment. Single factor experiments can generally be divided into variety comparison experiments and cultivation experiments. Multiple factor experiment is the simultaneous study of two or more than two factors in one experiment. Each factor has several levels (or called degrees, ranks). The factors are combined at different levels. This constitutes the treatment combinations of this experiment. For example, when studying the results of increased yields of a certain superior wheat variety under different density and fertilization conditions, a multiple factor experiment can be conducted including density and the amount of fertilization as the two factors. If there are three levels of densities, they can be designated dense, medium and sparse. If the amount of fertilization also has three levels, they can be designated as high, medium and low. Thus, this experiment will have nine treatment combinations of dense-high, dense-medium, dense low, medium-high, medium-medium, medium-low, sparse-high, sparse-medium, sparse-low (the meaning of "treatment combinations" in multiple factor experiments is similar to that of "treatment" in single factor experiments). This type of experiment can study the average effect of one factor at different levels of another factor and it can also study the mutual reaction between two factors to search for a comprehensive effect of the factors. Therefore multiple factor experiments are a means to provide a complete set of measures for the "superior variety and superior method of planting." But the number of factors to be studied should not be too large to prevent the experiment from becoming overly complex and as a result the experimental results cannot be analyzed.

The basic requirement of the design of field experiments is simplicity and consistency of the conditions. Consistency of the conditions means that except for the factor which is to be compared (such as the varieties in variety experiments and certain techniques and measures in cultivation experiments), all other conditions must be entirely consistent and experimental errors caused by differences of various conditions should be prevented or reduced as much as possible so that the experimental data will be accurate and reliable and the experimental conclusion will be correct and error free. Simplicity means that the content and design of the experiment should be suited to the local production level, the measures should be simple and easily performed so that the experimental results can be easily accepted by the broad masses and can be popularized over large areas.

II. Key Points in the Design of Small Area Experiments of Single Factors

1. The number of treatments should not be too numerous. Treatment is the content to be studied and compared in the experiment. The number of treatments should be based on the goal of the experiment. The key points should be prominent and 3 to 5 should be appropriately set up and at most they should not number over 10. A more visible demarcation should be set up among the treatments. For example, in an experiment of the sowing amounts of wheat, each treatment must be different by at least 5 jin, lesser differences will necessitate more treatments, increase the burden of land, manpower and materials and make it difficult for field operations and survey and recording to be consistent, thus easily causing experimental errors, and at the same time, visible differences cannot be easily seen among the treatments.

2. The control area must be set up rationally. Field experiments must have a control treatment area to serve as the standard for comparisons. If the control is not set up rationally, comparability is lacking, the experiment will fail to produce a correct conclusion. Therefore, the control must be set up rationally. For example, in variety experiments, the locally produced superior variety planted over the largest area in the locality should be selected as the control. New varieties which have just been test planted should not be used as the control, and separate controls should be set up for early, intermediate and late maturing varieties. The quality of the seeds of the control varieties should be the same or similar to that of the new varieties.

In cultivation experiments and other kinds of experiments, the techniques and measures most commonly used in production at the locality must be used as the control. In the experiments of soaking seeds in chemicals or spraying hormones and foliage sidedressing, such treatments as soaking in pure water or spraying with an equal amount of pure water should be performed as the control so that the effects of soaking seeds in chemicals or spraying hormones and foliage sidedressings can be correctly determined.

3. The area and the shape of the small area of experiments should be appropriate. In small area experiments, generally there are 5 to 10 treatments and each small area is sown for each treatment. The area of the small area should generally be from 30 to 100 square meters except for the primary materials in variety experiments and selection and determination experiments. One cannot simply plant only several square meters or one or two ridges. This is because the areas are too small, the differences in the soil are greater and it is difficult for the experimental results to be accurate. The area of the small area should be determined by the soil condition, the type of crop, the content of the

experiment, the amount of seeds. Where the soil is relatively even and consistent, the area of the small areas can be smaller, otherwise it should be slightly larger. The area of small areas in variety experiments is smaller and the area of small areas in cultivation experiments is larger. When the number of seeds is small, the area of the small areas should be smaller, and when the number of seeds is sufficient, the area can be larger. Determination of the area of the small areas can be made in reference to Table 1 and grasped in a versatile manner according to actual situations.

Table 1. Reference Table of Areas of Small Areas in Field Experiments of Crops

Crop Content of Experiment	Paddy rice, Wheat	Corn, Sorghum, Soybeans, Cotton
Variety experiments:		
Primary material	1 - 5	5 - 15
Selection and determination	3 - 10	10 - 25
Comparison of varieties and regional experiments	20 - 100	30 - 100
Cultivation experiments:		
General experiment	20 - 100	60 - 150
Interplanting, companion cropping, multiple planting experiments	100 - 333	200 - 333
Mechanized planting and cultivation experiment	200 - 333	667 - 1,334

The shape of the small area should best be rectangular. This is because the differences in the soil of rectangular shaped small areas are relatively smaller, and it is more convenient for sowing, field management, observation and recording. The ratio of the length and width of the small area generally should be 3:1 to 10:1 and this can be used in a versatile manner but an appropriate number of ridges and necessary protective rows must be assured in each small area. Some experiments, such as interplanting and companion cropping experiments, chemical spraying experiments, irrigation experiments, mechanized cultivation experiments, require more ridges and an approximately square shape can also be used.

4. Setting up repetitions in the experiment. In the experiment, simultaneous planting of all small areas lined on one piece of land is called a repetition. Simultaneous planting of all small areas lined on another piece of land is called a second repetition. They can be ordered as the first repetition, the second repetition,.... The number of repetitions is the number of plantings of each treatment on the entire experimental field. Each repetition includes several small areas, therefore repetitions are also called area groups. To overcome the experimental errors caused by the uneven fertility of the soil and to rationally estimate the experimental error and to statistically analyze the experimental

results, the experiment should set up several repetitions. The averages of several repetitions of the treatments are compared. Generally, the small area experiment is repeated three to four times. The repetitions should be zoned according to the fertility of the soil and the elevation of the fields. The principle of zoning should be followed, i.e., the direction of the rows in the small areas should be parallel to the direction of change of fertility of the soil and the direction of the small area groups should be perpendicular to the direction of change of the fertility of the soil so that the soil and other conditions in each repetition will be as consistent as possible. There can be appropriate differences between different repetitions. A path of 0.5 to 1.5 meters should be left between repetitions to facilitate field operations and observation and recording (see Figure 1).

First repetition	A	B	C	D	up (or infertile)
Path					Direction of slope of
Second repetition	C	A	D	B	
Path					the soil
Third repetition	D	C	B	A	down (or fertile)

Figure 1. The correct design of the zoning of repetitions according to the direction of the slope or distribution of soil fertility in small area experiments of varieties of corn

5. Field arrangement in small areas. The distribution of each small area of treatment in the field is called field arrangement. The small area single factor experiments generally use the following three arrangements:

(1) Random arrangement: Random arrangement is when each treatment does not follow any order in each repetition but the position is determined at random. Random arrangement is better than ordered arrangement (where each treatment is arranged in the same order during each repetition). It gives each treatment an equal opportunity in each repetition and each treatment is evenly distributed in each of the repetitions, reducing experimental error. At the same time, it uses less land than contrast arrangement because each repetition has only one control area and less land is being used. Small area experiments using random arrangement are also called random area group experiments. Random arrangement is suitable for variety experiments and various types of cultivation experiments. In variety experiments, when the participating varieties are more numerous, they can also be separated into several groups according to early maturity, intermediate maturity and late maturity and several random area group experiments can be conducted.

The actual method of random arrangement is as follows: Taking the corn variety experiment as an example, there are eight varieties, the experiment is repeated three times, the varieties are numbered 1,2,3,4,5,6,7, and 8. Of these, No 8 is the control variety. In the arrangement, three repetitions are zoned according to the conditions of the soil. Each repetition is divided into eight small areas. Then the eight varieties are written on eight pieces of paper for drawing. The first repetition is to be arranged first. The varieties picked at random will be planted from left to right in each small area consecutively. For example, if variety No 7 is picked first, it will be planted in the area at the left. If variety No 2 is picked as the second, it will be planted in the second area, and so on. The second and third repetitions will also be arranged accordingly. If a variety happens to be arranged in the same position in two or three repetitions, partial adjustment can be made so that each variety can be distributed more evenly (see Figure 2).

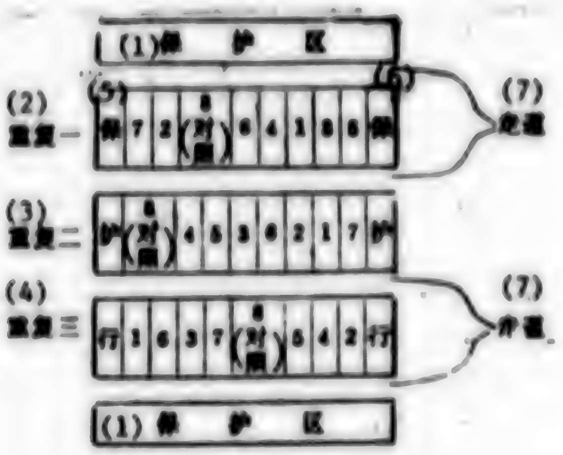


Figure 2. Randon arrangement in small area experiments of corn varieties

Key:

(1) Protective area	(5) Protective row
(2) First repetition	(6) Control
(3) Second repetition	(7) Paths
(4) Third repetition	

(2) Contrast arrangement: Contrast arrangement is to plant a control area right next to each small area of varieties to be tested. Comparison is made between each of the varieties and their neighboring control area. The contrast arrangement generally requires only two repetitions. Each repetition's individual treatment can also be arranged at random. In the contrast arrangement, because there are many control areas, more land is used (the control areas occupy 1/3 more land in the entire experiment), and the amount of field work is increased, therefore it is not as simple as random area group experiments. Contrast arrangement is suitable for variety comparison experiments.

(3) Interspersed contrast arrangement: Interspersed contrast arrangement is arranging the varieties (or treatments) in numerical order, and a control area is set up after every four or more treatments. This method has less control areas than the contrast arrangement and less land is used but the experimental results are relatively imprecise. It can be used when accurate yields are not needed. For example, in the observational nursery at the beginning period of variety experiments, there are a dozen to several dozen varieties or lines whose manifestations of the length of the growth periods at the locality, the seriousness of diseases and insect pests, the demands for fertilizers and water, the

strength of the ability to resist adverse conditions all have to be preliminarily observed. The interspersed contrast arrangement can be used. This type of arrangement does not require repetitions.

The field arrangement of contrast arrangement and interspersed contrast arrangement are shown in Figures 3, 4.

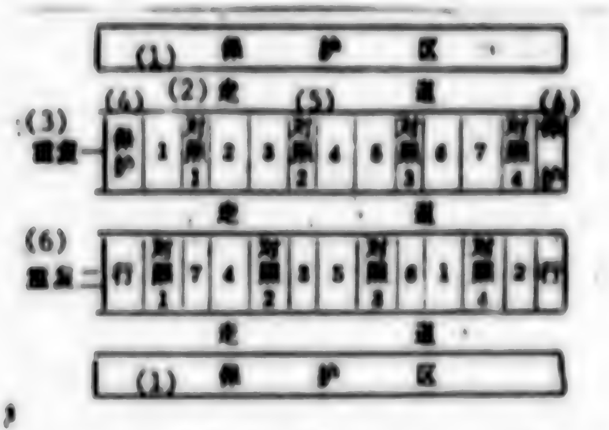
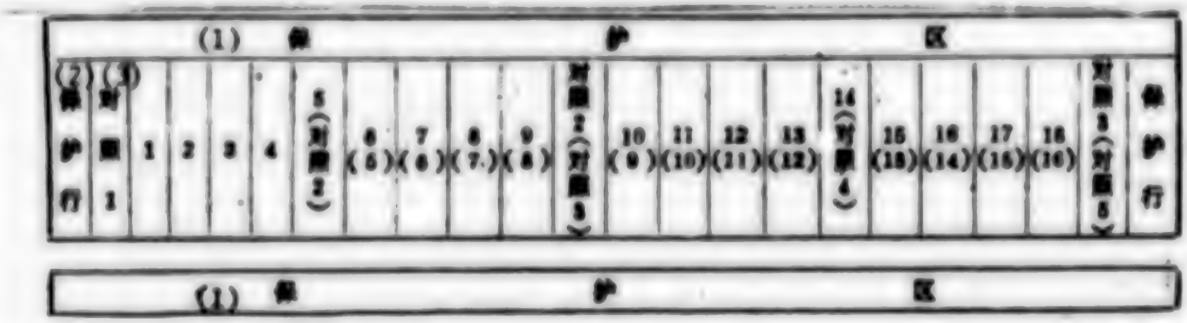


Figure 3. Contrast arrangement in small area experiments of corn varieties

Key:
(1) Protective area
(2) Paths
(3) First repetition
(4) Protective row
(5) Control
(6) Second repetition

Remark: In the diagram, 1,2,3,..........7 are numbered varieties.



Remark: In the diagram, 1, 2, 3.............18 are numbered varieties. The numbers outside the parentheses designate the arrangement of the control areas following every nine varieties. Numbers in parentheses designate the arrangement of the control areas following every four varieties.

Figure 4. Interspersed contrast arrangement in observation nurseries of varieties

Key:
(1) Protective area
(2) Protective row
(3) Control

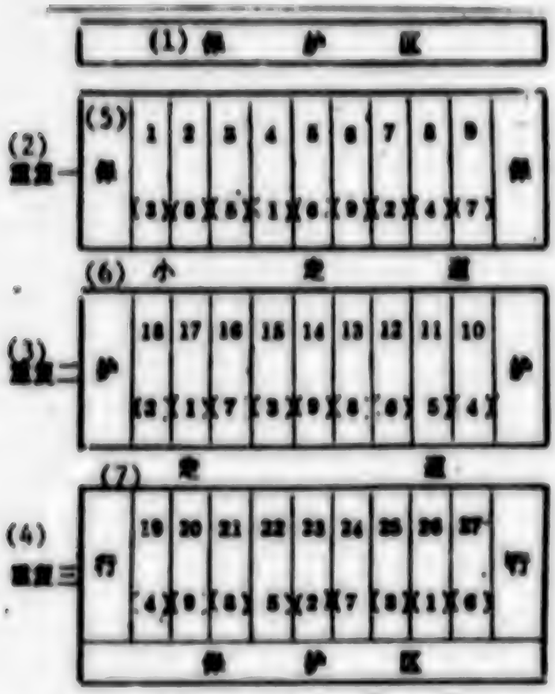
6. Setting up protective rows and separating zones and eliminating border influences. In variety experiments or cultivation experiments, the small areas on the two sides or the border rows of a small area frequently have special conditions and the growth of plants is sometimes good and sometimes poor. These manifestations are called border influences. For example, in the variety experiments of corn, tall and short stemmed varieties are planted together, the border row of tall stemmed varieties have good aeration and light permeability, conversely, the border row of short stemmed varieties are suppressed. In irrigation and fertilization experiments, the border rows of neighboring small areas frequently affect each other. Therefore measures must be taken to eliminate border influences. Besides separating tall and short stemmed varieties into groups for the experiment, more protective rows can be planted along the two borders of small areas. In irrigation experiments, a separating zone should be set up beside the irrigated small area. The yields of the protective rows and the separating zones are not included.

III. Key Points of the Design of Multiple Factor Small Area Experiments

The key points of the design of multiple factor small area experiments are basically the same as those of single factor experiments. The number of treatment combinations of multiple factor experiments must not be too numerous. Reducing the amount of work can be done mainly by reducing the number of factors and the number of levels of each factor. Control areas also need to be set up in multiple factor experiments. Each factor should include one contrast level. The treatment combination formed by each factor with the contrast level is the control area. The area of the small area experiments of multiple factors of each crop should not be smaller than that of cultivation experiments, the number of repetitions should be two to three times. The field arrangements of the small areas of multiple factor experiments are of the following two types:

(1) Random area group design: Each level of each factor is coupled with the other level of each factor to form several treatment combinations. Then they are numbered and drawn at random. They are then arranged at random in each repetition (the method is the same as that for single factor experiments). For example, there are three corn varieties A, B, and C. Each has three amounts of fertilization, high, medium and low, then there are these numbered combinations: (1) A-high, (2) A-medium, (3) A-low, (4) B-high, (5) B-medium, (6) B-low, (7) C-high, (8) C-medium and (9) C-low, a total of nine treatment combinations. These are grouped in areas at random and three repetitions are set up. The field arrangement in the small area is shown in Figure 5.

(2) Split area design: When one of the experimental factors is more important (i.e., when the factors can be ordered as primary and secondary), a split area design can be used to increase the degree of accuracy of analysis of the primary factor. Split area design is to mark out several large zones (called whole zones) based on the number of the levels of secondary factors in each repetition, then several small zones (called split areas) within each whole zone can be marked out according to the number of levels of the primary factor. It is a design method based on ordering of the primary and secondary factors. The actual procedure is to mark out several small areas according to the number of treatment



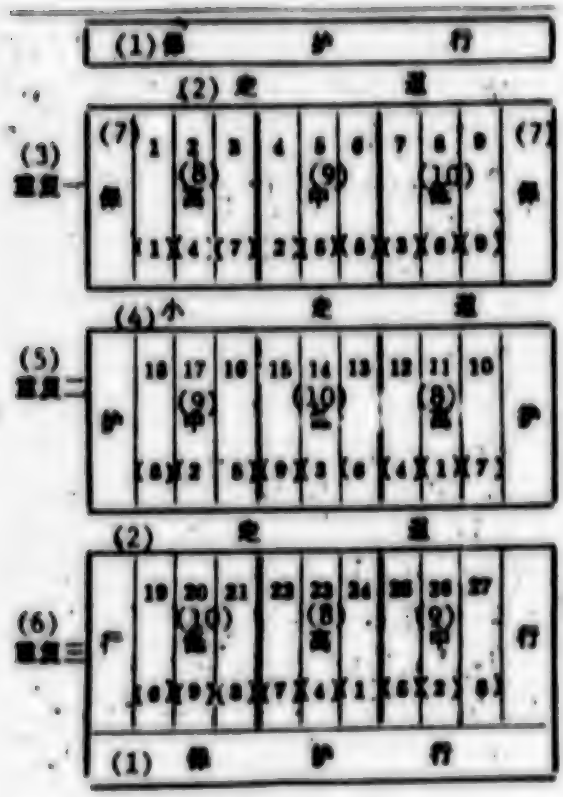
Remark: Numbers of the top row designate the numbers of the small areas, the numbers of the bottom row designate the numbers of the combinations of treatments.

Figure 5. Field arrangement in the design of small areas of random area groups in a multiple factor experiment

Key:

(1)	Protective area	(5)	Protective row
(2)	First repetition	(6)	Small paths
(3)	Second repetition	(7)	Paths
(4)	Third repetition		

combinations but each level of each secondary factor is arranged once at random within the whole zone (i.e., combining several small areas into a large area), then each level of the primary factor is arranged once at random within the border of each whole zone. Still using the experiment of the varieties of corn and the amount of fertilization described above as an example, and taking variety as the primary factor, the field arrangement of the small areas is shown in Figure 6.



Remark: In the diagram, the top row of numbers designate the numbers of the small areas, the numbers of the bottom row designate the numbers of the combinations of treatments, the double line is the dividing line of the whole zones.

Figure 6. Field arrangement of the design of small areas with split areas in a multiple factor experiment

Key:

(1)	Protective area	(6)	Third repetition
(2)	Path	(7)	Protective row
(3)	First repetition	(8)	High
(4)	Small paths	(9)	Medium
(5)	Second repetition	(10)	Low

Regardless of whether it is a single factor experiment or a multiple factor experiment, after the design of the experiment has been completed a written plan for the experiment should always be written and field planting diagrams should be drawn.

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QUICK PRESERVATION OF FOREST RESOURCES URGED

Guangzhou NANFANG RIBAO in Chinese 4 Sep 80 p 3

[Article by Zhou Yongsheng [0719 3057 3932]: "Quickly Save Guangdong's Forest Resources"]

[Text] Forests are the foundation of agriculture: they regulate climate, conserve water resources, save water and soil and increase soil fertility. In view of the fact that Guangdong's forest resources are now nearing the point of exhaustion, a matter of prime importance which Guangdong's agricultural construction should grasp in the 1980's is afforestation and tending young and middle aged forests, and agricultural, water conservancy, fertile soil and agricultural mechanization construction should all act together to build and protect forests. The important questions which Guangdong's forestry urgently needs to resolve now are:

1) Establish a provincial corps for the fundamental ownership of forest and mountain rights and issue certificates of forest and mountain rights; establish a system of forestry production responsibility to unite the protection of forests and the interests of the masses who live in forest zones; establish policies for privately owned forests and forests for firewood and charcoal to facilitate "delimiting a small area to protect a large one"; reaffirm the longstanding and effective policy on planting forests that "whoever creates, owns: the state, the collective and the individual are in unison"; perfect Guangdong's laws and organizations for creating and protecting forests to stop the wanton cutting and accelerate afforestation as quickly as possible.

2) Formulate and unify a series of policies and rewards to promote the development of Guangdong's forestry industry and raise the production and standard of living of the people in the forest zones; eliminate all policies and restrictions which are not favorable to the development of forestry and the diversification of forest zones; implement a policy to keep forest product prices abreast of food prices; thoroughly change the chaotic situation in Guangdong's forestry administration.

3) Resolve in an appropriate fashion the problem of fixed quotas for marketing staple foods supply in forest zones and consider reducing the public grain mission of forest zones.

4) Adopt resolute measures to reduce Guangdong's timber production mission and strictly control cutting (in the next 5 years, cutting should be limited to 1-1.5 million square meters).

5) Formulate short, medium- and long-range development plans for Guangdong's forestry and firmly and thoroughly carry out policies centered on forest management to develop forestry and use timber and establish and operate economic forests, water resource forests, shelter forests, turning the "four sides" green forests and farmland forest networks.

6) Raise special funds to accelerate the building of Guangdong's forest roads, protective organizations, forestry mechanization and small-scale hydroelectricity, and in a planned manner emphasize investment in establishing a group of state-run forestry bases.

7) Conscientiously strengthen scientific research in forestry (especially to improve comprehensive use of forests and strengthen research in wood substitutes), improve the political, economic and social position of forestry and forestry science personnel.

If the serious situation of the near exhaustion of forest resources and the deterioration of forestry structure in Guangdong can be improved in the 1980's, then in 1990 Guangdong's forest area will be over 250 million square meters and the rate of cover will be over 40 percent, so Guangdong's future agricultural development will have an excellent ecological foundation.

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GUANGDONG

SUGARCANE, SILKWORM COCOON OUTPUT POTENTIAL DISCUSSED

Guangzhou NANFANG RIBAO in Chinese 5 Sep 80 p 3

[Excerpt] The flatland area in the Zhujiang Delta, an important comprehensive area of diversified cash crops and at the same time an important base for commodity grains, very much needs specialized study to adopt some feasible policies and measures and to formulate developmental plans. Sugarcane should be studied as a cash crop. In 1979 (not including the short season which goes beyond the end of the year) Guangdong produced about 8 million tons of sugarcane and produced 980,000 tons of sugar. The Zhujiang Delta (including Foshan and Huiyang) produced 3.192 million tons of sugarcane and 450,000 tons of sugar, being 40 percent and 41 percent of the province's total output of these items respectively. Furthermore, the output per mu of sugarcane and the output of sugar is very high. Calculated on the basis of 1979, in the entire province, it took an average of 2.65 mu to produce 1 ton of sugar, but in the Zhujiang Delta it took on the average 1.7 mu and in the highlands it reached 1 ton per mu. These are superior conditions for developing the sugarcane and sugar extracting industries. Nationally, 1979 sugar production was about 2.5 million tons, but consumption reached 3.5 million tons, a shortfall of about 1 million tons. In 1979 we imported 1.5 million tons of sugar which, calculated at present prices, required an expenditure of over US $1 billion in foreign exchange. In view of this, the leadership comrades of the Central Committee this year proposed that South China develop sugarcane, and if after a certain number of years it reached the point where it was not necessary to import sugar, it might even be possible to export some and import some food grains, thus resolving this area's need for grain. Guangdong should courageously pick up this task. Guangdong Province has a sugar-extracting capability of over 1.3 million tons, but present facilities use rate is only 60-70 percent, so adding another 300,000 tons would not be difficult. Guangdong now has 3.7 million mu planted in sugarcane, though the record is as much as 4.7 million mu. The Zhujiang Delta would only have to increase sugarcane planted by 500,000 mu to add another 300,000 tons of sugar. The key question is food grains. The conditions for solving this problem already exist, but there should be some very good planning. There are also the silkworm and mulberry questions. Silkworm cocoons and raw silk are traditional exports of the Zhujiang Delta. Eight silkworm crops can be produced each year, which is something other provinces cannot do. The record for the highest output of silkworm cocoons in Guangdong was as high as 1.5 million dan, but the output in 1979 was only 410,000, less than one-third of the record level. This is mainly a food grain question, too. Related to silkworms and mulberries are production of bananas and pond fish. The time has come when it is urgently necessary to formulate development plans for these crops.

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PLANTING MULBERRY TREES, RAISING SILKWORMS STEPPED UP

Guangzhou NANFANG RIBAO in Chinese 8 Sep 80 p 1

[Text] This year the silkworm cocoons of the first to fifth crops increased with each crop. By the end of August, the total amount of silkworms accumulated in the province was over 315,000 dan, an increase of 17 percent over last year, including 76,100 dan from the fifth (August) crop, which was an increase of 49 percent over the same period last year and set a new record for the highest level of fifth crop silkworm cocoon production in the country. The important silkworm cocoon area of Shunde County produced over 150,000 dan in the first to fifth crops, including a fifth crop output which increased 60.6 percent over last year.

Guangdong Province is one of the nation's four largest silkworm producing areas and leads the nation in the number of silkworm crops and output of silkworms per mu of mulberry trees annually. This year, areas of the province have enhanced this superiority and have made planting mulberry trees and raising silkworms an important means of making money. At the same time that mulberry groves are being expanded, old groves are being actively managed and efforts are being made to raise output per unit of area. The volume of the first silkworm cocoon crop of the year increased 21 percent over the same period last year.

After this, the cadres and masses of the silkworm producing areas continued to exert themselves to plant and fertilize mulberry trees and carefully managed them, and with the addition of average rainfall this year, the mulberry groves produced more with each crop to establish a foundation for continuing to increase silkworm cocoon production. In the process of developing silkworm cocoon production, many government and party leaders of new silkworm producing areas got into survey and study, summarized and expanded local advanced experience of "promoting grains with silkworms and getting good harvests in both grain and silkworms," and promoted the development of silkworm and mulberry tree production.

The Lianjiang County committee appointed a deputy secretary to take charge of silkworms and mulberry trees. The area in mulberry trees in the county increased from last year's 500 mu to the present 6,400 mu. The output of just the first five crops of silkworm cocoons this year surpassed last year's total output of cocoons by 1.3 fold. Now, mulberry trees at various locations about the province are growing very well, and silkworm starts supply has fallen short of demand. Thus concerned provincial sections are helping localities adjust surpluses and shortages, and Shunde County even sent someone specially to Zhejiang to ship back by air silkworm starts to satisfy the needs of expanded production.

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RESPONSIBILITY SYSTEM IN AGRICULTURE DISCUSSED

Hangzhou ZHEJIANG RIBAO in Chinese 2 Oct 80 p 1

[Article: "Need for Further Enhancement and Perfection of Production Responsibility System in Agriculture Pointed Out by Comrade Tie Ying [6993 3841] in Speech to Provincewide Propaganda Work and Mountain Areas Work Conference"]

[Text] On 25 August, Zhejiang Province CCP First Secretary, Comrade Tie Ying, expressed some views on the further enhancement and perfection of the responsibility system in agriculture in a talk given to the provincewide Propaganda Work and Mountain Areas Work Conference. This portion of his talk has been excerpted for publication below.

Comrade Tie Ying said in his report that since the Third Plenary Session of the 11th Party Central Committee, by following the spirit of the two Central Committee documents on the development of agriculture, through diligent adherence to implementation of a series of party policies for rural villages, by emphasizing consistency in the system of ownership, and by enhancing the system of responsibility, very good results have been obtained. Throughout the province, the "three echelons of ownership with the team as the foundation" as the basic system for people's commune is stable; agricultural production has developed rapidly in the overwhelming majority of places, and the collective economy has become increasingly consolidated. During last winter and this spring, CCP committees at every echelon have personally acted to survey and study, to readjust the size of some production teams, and to establish and perfect various forms of systems of responsibility for production in each industry, and great progress has been made in the administration and management of communes and brigades. However, some problems continue to exist, as for example, the unstable or unsuitable size of a minority of production teams. In some places the appearance of contracts with households for guaranteed production or the distribution of drylands to households has aroused controversy among cadres and the masses. In the management of the labor force, many places have imposed killing restrictions for a long period of time. Where there should be a dispersal of administration, dispersal of administration has not been permitted; and where labor should be permitted to work outside of farming, it has not been permitted to do so. In other places, however, there is no management over the labor force's movements; it is allowed to drift. Restrictions have been too extreme for the buying, processing, and transportation for sale of agricultural sideline products. Communes and brigades have an obligation only to produce numerous agricultural sideline products; they have no rights in how they will be disposed of. Every jurisdiction should conscientiously investigate and study these problems, properly analyze local realities, fix work programs by adjusting methods to the local situation, adroitly guide action according to circumstances to carry out tasks, conscientiously do a good job, and resolve contradictions. Resort to coercion and commandism, and methods that rely on repression and acting tough will not do. Trying to dodge conflicts and just letting things drift along without doing anything about them is no good either.

Comrade Tie Ying said that for rural villages to prosper, main reliance will have to be placed on collective strength, with across-the-board development of agriculutre, forestry, livestock raising, sideline occupations, fisheries and industrial production, the launching of diversified enterprises, continuous increases in income and improvement in the life of the masses. The main energies of all our echelons of leadership should be put into how to further consolidate and accelerate development of the collective economy and into taking maximum advantage of the superiority of the collective economy. We do not need, nor should we promote, a provincewide contracting for guaranteed production with individual households. In an extremely small minority of places where little development of production has occurred since cooperativization, and where the people's living standards have not improved, the use of contracts with households for guaranteed production as a temporary expedient in overcoming difficulties is permissible. But contracting with households for guaranteed production cannot become the sole means of overcoming difficulties. Contracts with households for guaranteed production most certainly is not the future direction of development for rural villages. Those who say that "contracts with household for guaranteed production and division of the fields for individual farming is inevitable" are mistaken. This point must be clearly stated to the broad masses of peasants. To say this is not to say that our province does not want to liberalize policies; it is to say that we will proceed from realities to study the question of a liberalization of policies. The so-called liberalization means reform of those irrational regulations that fetter the development of productivity so that production relationships will suit the character of production forces. Whatever needs liberalization and whatever needs changing will be done, to be sure, on the basis of realities in the local area and in the local units, with the adaptation of general methods to specific situations. In our consideration of the size of production teams, the form of systems of responsibility for output and methods of distribution, we must first consider the level of development of production forces, and on the basis of needs for development of agriculture, forestry, livestock raising, sideline occupations, and the fishing industry, make investigation and study to formulate policies and methods that are geared to actual circumstances. At every echelon, comrades in positions of responsibility must dare to seek truth from facts, and proceed from realities to implementation of the party's policies. Throughout the province, we must distinguish individual areas of different kinds to make formulations on major policy problems, and at the same time, it is necessary to require each place to do things on the basis of local realities and not standardize or "cut all problems with the same knife."

In his report, Comrade Tie Ying pointed out that during this winter and next spring major action is to be taken in rural villages for the improvement of administration and management and the strengthening of the system of responsibility. He also made known some views on specific policy questions.

1. The Problem of the Size of Production Teams

Briefly, the size of the overwhelming majority of production teams in Zhejiang Province is proper and should be kept as is. In cases where the size is not proper and where the masses have called for a restructuring of the production teams, suitable restructuring should be done where it benefits production and where it benefits unity. Stability and restructuring are apparently contradictory, but in fact are one. To talk only about stability without solving conflicts that actually exist is to have no stability. Proper restructuring to solve conflicts permits stability. On this issue, we have the lessons of experience. If you do not take account of realities, put things together that should not be put together and separate things that should not be separated, and turn everything topsy turvy, you are bound to suffer. To suppose upon hearing of the division of a team that "division into tiny teams" is meant and that such is not allowed and will not be accepted is wrong, but to allow the masses to make divisions spontaneously, dividing in any way they see fit and abandon leadership is also wrong. We cadres must take the initiative in explaining reason to the masses and discuss with the masses ways of resolving conflicts to put problems to rest through leadership. For example, in mountain regions where the land is vast but people scant and people are dispersed, the size of the production teams has to fit the characteristics of the mountain area. On the plains there are also a small number that are too large in size, making for difficulties in management and causing problems for production. When a majority of the masses urgently call for division of the teams, after the autumn harvest is in and before winter planning is begun, and following approval, they may be divided through leadership. In cases where production teams have been already divided without authorization, where the size is basically suitable, reasonable, and freely desired by the masses, approval should be given as soon as possible, and they should be helped to select cadres, open accounts with banks and set up accounting systems, and establish various management systems to help get on with production. In a small number of cases where division has made production teams too small, seriously hurting production, a good job must be done in mobilizing the masses to put things right of their own accord. In some production teams with stability in key cadres and where agricultural sideline production is going along well, but where the masses call for division of a team, principally because it is too large with numerous conflicts in administration and management resulting, the team may be divided into vocational teams (including agricultural teams and sideline production teams) in a system of responsibility whereby contracts are made with the teams for guaranteed production. In the process of restructuring the size of production teams, preservation of collective property and satisfactory arrangements about pertinent policy questions has to be emphasized; destruction of mountain forests, machinery, equipment, and buildings cannot be allowed.

2. Problems About a System of Responsibility for Production

We must continue to strengthen systems of responsibility for production in all industries. The form of the system of responsibility may be contracts with small sections, calculation of remuneration for fixed quotas, or it may be a work contract for guaranteed production, or calculation of remuneration for joint production, with the adaptation of a general system to specific situations with flexibility and diversity and no "one and only" approach. So long as the principles of socialist collective ownership and distribution according to work are adhered to, and so long as the system encourages the development of production, consolidates the collective economy, and is one that the masses want, the actual form of the system is not important, and there should be no hasty deciding on one system and turning down of another. The "several fixes and one reward" system of responsibility that we have advocated and promoted since last year on the foundation of specialized division of labor is a form of a system of responsibility for joint production. Experience has shown results to be good, and promotion of this method should be continued. Such a system of responsibility of "several fixes and one reward" with calculation of remuneration for joint production, employing contracts with individual specialized trades in agriculture, forestry, livestock raising, sideline occupations, fisheries, industries, and commerce can serve to team up the superiority advantages of unified administration and cooperation in the division of labor in the collective economy with arousal of the enthusiasm of specialized vocational units, of households with specialized vocations, and of individual commune members. It is a quite good system for the contracting of production. In the contracting for agricultural production, provided the "four unifications" are maintained some fairly large production teams may also individually adapt general methods to specific situations for contracting with teams for production from croplands, with joint output and calculation of rewards or losses to be paid. As for the institution of what is termed, "system of responsibility for joint production," wherein work teams are divided up into "small but complete" units, and which is, in reality, a way of changing the basic accounting unit, we remain opposed.

3. Problems in Contracting With Households for Guaranteed Production

We have already said in the foregoing that we want to actively develop collective production, and that we do not advocate contracting with households for guaranteed production. Though contracting with households for production differs from dividing up the farmland for farming by individual farmers, unless it is done right, it can easily slip into the division of land for individual farming. In an extremely samll minority of places where production has not grown for a long period of time, where the peasants' lives are full of hardships, where the collective economy has not operated well, and where contracting with individual households has already taken place, it may be permitted. But the leadership must actively guide and earnestly help these places vigorously develop productivity, and assist them to develop collective production. In many places, experience has demonstrated that all that is needed is for these places to put in a samll reservoir and a small hydroelectric power plant, to establish economic crop or livestock bases, and to organize the masses, and then progress can be made from a low level of collectivization to a high level of collectivization. The mainstay of the economies of these areas is still the production team, and there must be adherence to ownership by the production teams of the means of production. Production plans including capital construction, drainage and irrigation, combat against calamities, and the prevention and control of diseases and insect pests must be taken care of in a unified way by production teams, and income within the system of contracting for production must be distributed in a unified way by the production teams. In making distribution, proper care must be taken of families suffering hardship, households enjoying the five guarantees [childless and infirm old persons who are guaranteed food, clothing, medical care, housing, and burial expenses], and families of those who have died in battle.

In order to make fullest utilization of the land and to unearth potential for production, and to increase the income of the collective and of individual commune members, contracting with individual households for production may be permitted for odd bits of scattered land in out of the way places that are not suited to collective administration. But several principles must be kept in mind. 1) the land area in the collective plan may not be changed; 2) there can be no impairment to water and soil conservation, no damage done to water conservancy facilities, or no damage done to water and land transportation; 3) large tracts of wilderness lands, wilderness mountains, beach areas, and drylands must be operated collectively; 4) tracts on which economic crops like mulberry trees, tea, and fruit are grown may not be touched. The method by which production is contracted may be fixed output (output value), premium payments for excess output, recording of workpoints for the tendering of money or for the tendering of products, or some other method.

4. Problems in the Management of Rural Village Labor Forces

A rational apportionment of tasks and appropriate arrangements must be made for the rural labor force on the basis of actualities in each locale and with consideration for the needs of production in agriculture, forestry, livestock raising, sideline occupations, and fisheries, and in commune and brigade industries. In the past we have criticized the outward flow of labor from farming, going it alone in sideline occupations, forsaking agriculture for commerce, the lack of clear limits, the need for clearly defining limits, and a proper liberalization of policies. We must realize the following two facts: one is that Zhejiang Province has a lot of people and scant land. Most places have surplus labor and an outlet for this surplus labor is a major problem. Second is that a fairly large number of people in the rural villages of Zhejiang Province are not dependent solely on farming for a living. In Dongyang, Yiwu, Yongkang, and Tiantai counties, for example, there are quite a few handicraftsmen and vendors who are engaged in all sorts of handicraft labor and business activities. It must be realized that in many places this is a major source of wealth for the collective economy and that it is a distinct advantage for the rural economy of Zhejiang Province. We must promote its development through leadership and through organization, and open avenues to make the most of this advantage and certainly not restrict it. These people are greenhorns when it comes to farming, but they are experts in their own fields of activity. When they leave farming, not only can they increase the collective and their own individual income, but they are needed by society. Contrarily, if they are restricted from leaving farming and they are forced to farm, society, the collective and the individuals all have no benefit. Consequently, so long as the collective output is not impaired and so long as there is no exploitation of the labor of others, and when permission is given and certification made by communes and brigades, carrying on handicraft labor or engaging in the peddling of odds and ends of the three categories of agricultural sideline products or native products should be allowed. Naturally, conduct inimical to the welfare of the collective or in contravention of national policies and laws, or conduct that disrupts the market must be punished economically and under the law.

One outlet for the rural village labor force is the broadening of avenues of production within agriculture through diversified farming and intensive farming. Another outlet is to permit some of the labor force to leave farming to go into legitimate economic activities. Communes and brigades can organize various kinds of technically proficient people to set up collective specialized units (teams), such as construction, transportation, business, and service units (teams). Those who cannot be readily organized should be allowed to work as individuals. No matter the form, there must be an intensification of management for good handling of the relationship between commune members who leave the team and commune members who remain in the team and do farming. Production brigades should conclude contracts or agreements with commune members who leave the team and commune members who remain in the team and do farming. Production brigades should conclude contracts or agreements with commune members who leave, stipulating for how long each year they will return to the brigade to engage in agricultural production. The distribution of benefits can be done by the system of paying money on the basis of workpoints, payment of money and distribution of grain, and payment of public accumulation and management dues, putting matters on a collective economic course.

5. Problems in Management of Commune and Brigade Enterprises

Nowadays commune and brigade enterprises in some places lack democratic management, and their relationship with the production teams and the masses becomes more and more distant. Management of the production of the enterprises, payments and disbursements of funds, and distributions of profits are all done as a small number of people direct, and the masses have no say. Furthermore, the management organization imposes management fees and handling fees about which the masses have a lot of complaints. This problem has to be solved. All commune and brigade enterprises should establish and perfect democratic management systems. The important matters of production, financial affairs, and distributions of the enterprises should be discussed and decided by both a commune and brigade management committee, and a meeting of commune member delegates. In the distribution of profits of enterprises, except for retention of sufficient accumulation to expand further production, a portion should be released to production teams for distribution in order to increase the income of the peasants.

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TITLE: "Microclimate Concerning the Behavior of Flowering and the Pollen Spread for Successful Fruiting in Autumn Hybrid Rice"

SOURCE: Nanjing NANJING DAXUE XUEBAO (ZIRAN KEXUE) [JOURNAL OF NANJING UNIVERSITY (NATURAL SCIENCE EDITION)] in Chinese No 3, Sep 80 pp 114-128

TEXT OF ENGLISH ABSTRACT: The relationship among the behavior of flowering, pollen spread in hybrid rice seed fields under autumn conditions and the meteorological conditions has been investigated. It was found that the florescence and time of flowering and pollen production appeared not only in close correlation with the weather conditions and the air temperature, but also with the air humidity. Higher humidity was required for flowering when the temperature was lower, and vice versa. The air temperature and humidity for flowering compensated for each other. A larger angle between the orientation of planting in the seed field and the prevailing wind direction benefited pollination. According to the data observed in the fields for four days, the pollen production spread in the maternal parent line along a south-north orientation is 28 percent higher than that of an east-west orientation.

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